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An address by Secretary of Agriculture Claude R. Wickard, National Farm and Home Hour, July 7, 1943.

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We all know the heavy demands that our record numbers of livestock are making on available feed supplies. Everything we can do to conserve feed or use it more efficiently will be helpful to the war effort. It is just as much of an achievement to save a bushel of feed as to grow a bushel. Either way helps just as much in turning out the war-needed meat, milk, and eggs.

Dairy farmers have especially heavy feed requirements; for this reason they can do a great deal in the national task of balancing feed supplies with feed requirements. So I want to tell you today about some of the experiments of the Bureau of Dairy Industry in the Department of Agriculture. These experiments point the way to more economical use of feed and show how feed in some cases can be made to go farther.

For example, there are methods by which many dairy farmers can produce more protein right on their own farms. This not only will help relieve the national feed situation, but also will reduce the farmers' feed costs.

One of these methods is cutting hay crops at an early stage of maturity. The dairy specialists now know that legumes and grasses cut for hay at early stages will yield more protein than the same crops cut at late stages of maturity. For example, the Bureau of Dairy Industry reports a 3-year experiment with irrigated alfalfa at a Montana field station.

The hay was cut at three stages -- first bloom, half bloom, and full bloom. The yield of hay per acre was about the same in all three cases, but the early cut hay yielded over 40 percent more protein per acre than the hay cut at full bloom. The gain in protein yield per acre when the hay was cut at the early stages was about the same as the amount of protein in $\frac{1}{2}$ ton of cottonseed meal or soybean meal. This is a real saving.

Another experiment aimed at comparing mixed grasses and clovers cut at about 45 days growth with those cut at maturity. Grass cut at 45 days growth produced 602 pounds of protein per acre and that cut at maturity only 368 pounds

of protein per acre. Cutting at the most favorable time resulted in 65 percent more protein. The difference, if bought in the form of high-protein meals, would add greatly to the dairyman's feed bill.

The Bureau has reported similar results with Sudan grass cut for hay at an Oklahoma field station. Hay cut at the first-heads-out stage yielded 404 pounds of protein per acre, while hay cut at the soft-dough stage yielded only 285 pounds per acre. This is a difference of 119 pounds of protein per acre.

These experiments indicate some of the methods by which a farmer can produce his own protein with small, if any, additional expense.

Other experiments show how scientific feeding practices can conserve feed. For a number of years the Bureau of Dairy Industry research men ran extensive tests to determine how much cows could produce when they were fed only good roughage, without any grain whatever. These experiments showed that when a good quality of hay was available, cows would eat large amounts; and during the lactation period would produce 60 to 70 percent as much milk as they would when fed a full grain ration. The lack of grain in the ration was more noticeable and cut milk production more sharply during the first half of the lactation period than it did during the latter half. The cows just weren't able to eat enough of the bulky roughage to give them the nutrients for a higher level of production.

Then the investigators tried what they called a limited grain ration. They fed the cows 1 pound of grain to each 6 pounds of milk produced per day -- just half as much as is fed in a full grain ration. Cows on the limited grain ration produced 85 to 90 percent as much as when they received the full grain ration. That record is not at all discouraging, especially at times when grain supplies are tight.

Among other efforts to find the best way of limiting grain consumption is that of feeding different amounts of grain at different stages of the lactation period.

The Bureau of Dairy Industry now is planning a new experiment along these lines. This test would call for giving cows a full grain ration during the first third of the lactation period, a half ration for the second third, and no grain at all during the final third of the lactation period. This would average a little less than a 1 to 6 grain ration for the whole period, and people in the Bureau believe that it may give good results.

Other research work has gone at the feeding problem from another angle -- that of comparing single grain with mixed grain rations. Experiments of this kind were completed recently at three of the Bureau's field stations located at Woodward, Okla.; Hannibal, Mo. and Mandan, N.C. Those experiments show that dairy cows will produce well and economically on a grain ration composed of a single grain, such as corn, barley, or kafir, if they receive all the legume hay and silage they want. The results indicate that the complicated grain mixture, often containing 6 or 8 different grains or grain products, is not necessary for good production.

In the experiments four cows at each of the different stations were fed a single grain, in one case barley, in another corn, and in the third kafir, in comparison with four cows at each station that were fed a grain mixture composed of 4 or 5 grains and byproducts. In addition to the grains the cows were fed all the alfalfa hay and silage they would eat. They were on the experimental rations throughout one lactation period.

The cows on the single grain produced 93 percent as much milk and 95 percent as much butterfat as the cows receiving the grain mixture. The experiments indicated clearly that good production may be expected of cows fed a grain ration restricted to a single low protein grain where ample amounts of good roughage are available.

Those are just a few examples of feeding research being done in the dairy field alone. Similar work is going on for livestock and poultry, and I hope to be able to talk to you about it some Wednesday in the near future.

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